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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/731,446	12/10/2003	Raghunath Vitthal Chaudhari	4062-109	5119
23117	7590	03/31/2006	EXAMINER	
NIXON & VANDERHYE, PC 901 NORTH GLEBE ROAD, 11TH FLOOR ARLINGTON, VA 22203			PASTERCZYK, JAMES W	
			ART UNIT	PAPER NUMBER
			1755	
DATE MAILED: 03/31/2006				

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/731,446

Applicant(s)

CHAUDHARI ET AL.

Examiner

J. Pasterczyk

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 13 February 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,2,4-6 and 8-11 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2,4-6 and 8-11 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

1. This Office action is in response to the amendment filed 2/13/06 and refers to the Office action mailed 9/13/05.

2. The specification is objected to because it appears to have two example 4s; one should be example 3.

3. Claims 1, 2, 4-6 and 8-11 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Each of the examples in the specification is drawn to one specific linking compound with a terminal nitrogen group; none is drawn to one having a terminal sulfhydryl, allyl, or vinyl group, yet in the composition claim only the nitrogen specie is claimed, while in the process claims in each instance the terminal Z group becomes a nitrogen group though it may begin as a sulfhydryl, allyl or vinyl group. No source of nitrogen is described for this transformation. Further, in both the composition and process claims, the terminal nitrogen atom still has two dangling valences despite one clear covalent bond to the methylene chain and a dative bond to the metal atom, and the two oxygen atoms bonded to the silicon atom also have two dangling valences. Such species would be highly reactive and thus not capable of existence for long in nearly any environment other than a vacuum. Finally, a transition metal atom of groups 8-10 would very likely not be stable if bonded to only two ligands, one a monodentate nitrogen ligand, the other apparently a monodentate phosphine ligand. Thus it appears as if the description of the invention as claimed is not consistent with what one would expect based on ordinary principles of chemistry.

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4. Claims 1 and 2 are objected to because of the following informalities: in each of these claims, correct the spelling to mesoporous instead of meosporous. Also, the current and much less ambiguous terminology for group VIII is groups 8-10. Appropriate correction is required.

5. Claims 1, 2, 4-6 and 8-11 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claims 1 and 2, again the oxygen atoms bonded to the silicon atoms have two dangling valences and the terminal nitrogen atom has two dangling valences, species which are highly unlikely to exist in reality, thus it is not clear what the structure of the composition in fact is. Also, the transition metal is not going to be stable with only one phosphine ligand bonded to it in addition to the nitrogen atom, hence the x must in fact be a coefficient for the number of phosphine ligands L bonded to the metal, yet this fact is not found in the claims or even the specification.

Further in claim 1, third line from the end, insert --, the matrix-- after "surface" for clarity.

Further in claim 2, it is not clear how the nitrogen atom of formula I results from Z being -SH, allyl, or vinyl. In formula II, the arc should be more clearly drawn connecting the O and N atoms, and this formula only results in one phosphine ligand being bonded to the transition metal, while in formula I it appears that more phosphine ligands are required to complete the valence and electron count of M.

In claim 9, the specific anionic chelating ligand recited is not found in claim 8 from which this claim depends.

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6. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

7. Claims 1, 2, 4-6 and 8-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over each of Dai, JP, Gryaznov, and Pugin as cited in and for the reasons of record given in paragraphs 9-12 respectively of the previous Office action.

8. Applicant's arguments filed 2/13/06 have been fully considered but they are not persuasive.

Regarding Dai, applicants assert that this reference focuses on placing transition metal compounds on the outside of a support rather than the inside. However, Dai clearly discloses placement of such compounds within pores, which reads on "interior surface" of the present claims. Neither are the present claims limited to microporous materials, while Dai discloses its composition for mesoporous materials as well as microporous channels; col. 2, l. 12. Contrary to applicants' assertion, the Dai reference does in fact disclose transition metals being bonded to the nitrogen ligand; see col. 4, l. 1-15. While these may not be organometallic compounds, neither are those of applicants since no M-C bond is required in them. In response to applicant's argument that Dai has a different use than the present claims, a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim.

Regarding JP, again applicants assert that the reference does not disclose the binding of organometallic compounds to the Lewis basic site, yet the present claims do not require a compound with a M-C bond. The use of blocking groups is conventional in organic synthesis,

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for example converting a carboxylic acid to an ester to prevent reactions with the acid's carbonyl oxygen. Again, although the reference is silent on whether the silica is mesoporous or microporous, such types of porous support are conventional in the art, hence that JP lacks disclosure of them is unavailing. And because such supports are porous, it would be inevitable that some amount of the amino ligand would reside in the pores of such a support instead of on an exterior surface. One of ordinary skill in the art who wanted the transition metal on the silica as a compound instead of the elemental metal would have known to simply not calcine or sinter the intermediate composition of JP.

Regarding Gryaznov, again applicants appeal to the intended use of the prior art composition, yet as noted for Dai above, such an appeal is unavailing absent a structural difference between the claimed composition and the intermediate of Gryaznov. And as for JP above, one of ordinary skill in the art wishing for the metal compound of Gryaznov to be bonded rather than being present in a film would simply have not vulcanized the prior art intermediate.

Finally, regarding Pugin, again applicants appeal to their intended use but again to no avail for the reasons given above for Dai. Applicants also assert that Pugin is drawn to a homogeneous catalyst, yet the catalysts therein are all bonded to silica gel, which is conventionally recognized as forming a heterogeneous catalyst.

9. This Office action cannot be made final solely due to the new ground of 35 USC, 1<sup>st</sup> paragraph rejection made in paragraph 3 above.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to J. Pasterczyk whose telephone number is 571-272-1375. The examiner can normally be reached on M-F from 9 to 5:30.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jerry Lorengo, can be reached at 571-272-1233. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



J. Pasterczyk

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3/22/06



J.A. LORENZO  
SUPERVISOR, PATENT EXAMINER